

WHAT IS CLAIMED IS:

1. A data recording apparatus comprising:

a recording/erase unit configured to record or
erase target data by irradiating a DVD-RW medium with
5 light beams with different intensities to change a
phase change recording layer of the medium to a first
data recorded state, second data recorded state, and
data non-recorded state; and

an additional recording control unit configured to
10 control additional recording of target data in response
to an additional recording instruction by recording the
target data by changing the phase change recording
layer to the first and second data recorded states and
by changing the phase change recording layer to the
15 data non-recorded state from a recording terminal end
of the target data over a predetermined length using
the light beams with different intensities emitted by
the recording/erase unit.

2. An apparatus according to claim 1, wherein the
20 additional recording control unit searches for an area
in the data non-recorded state with the predetermined
length in response to the additional recording
instruction, and records the target data from one end
to the other end of the found area.

25 3. An apparatus according to claim 1, wherein the
additional recording control unit searches for an area
in the data non-recorded state with the predetermined

length, which is present on an innermost periphery side in a data recording area of the medium, in response to the additional recording instruction, and records the target data from one end to the other end of the found area.

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4. An apparatus according to claim 1, wherein the additional recording control unit searches for an area in the data non-recorded state with the predetermined length, which is present on an innermost periphery side in a data recording area of the medium, by skipping in increments of predetermined length from a start point on the innermost periphery side of the data recording area of the medium in response to the additional recording instruction, and records the target data from one end to the other end of the found area.

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5. A data recording method for additionally recording target data on a DVD-RW medium in response to an additional recording instruction, comprising:

recording target data by irradiating the medium with light beams with different intensities to change a phase change recording layer of the medium to a first data recorded state and second data recorded state; and

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changing the phase change recording layer to a data non-recorded state by irradiating the medium with a light beam of a predetermined intensity from a recording terminal end of the target data over a predetermined length.

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6. A method according to claim 5, wherein an area
in the data non-recorded state with the predetermined
length is searched for in response to the additional
recording instruction, and the target data is recorded
5 from one end to the other end of the found area.

7. A method according to claim 5, wherein an area
in the data non-recorded state with the predetermined
length, which is present on an innermost periphery side
in a data recording area of the medium, is searched for
10 in response to the additional recording instruction,
and the target data is recorded from one end to the
other end of the found area.

8. A method according to claim 5, wherein an area
in the data non-recorded state with the predetermined
15 length, which is present on an innermost periphery side
in a data recording area of the medium, is searched for
by skipping in increments of predetermined length from
a start point on the innermost periphery side of the
data recording area of the medium in response to the
20 additional recording instruction, and the target data
is recorded from one end to the other end of the found
area.

9. A DVD-RW medium comprising a phase change
recording layer,

25 wherein the phase change recording layer is
changed to a first data recorded state, second data
recorded state, and data non-recorded state upon being

irradiated with light beams with different intensities,
and

the phase change recording layer records target
data when the phase change recording layer is changed
5 to the first and second data recorded states, and the
phase change recording layer is changed to the data
non-recorded state over a predetermined length from
a recording terminal end of the target data, upon being
irradiated with the light beams with different
10 intensities corresponding to additional recording
control of the target data.

10. A medium according to claim 9, wherein the
target data is recorded from one end to the other end
of an area in the data non-recorded state with the
15 predetermined length, which is found by a search from
the phase change recording layer, in correspondence
with additional recording control of the target data.

11. A medium according to claim 9, wherein the
target data is recorded from one end to the other end
20 of an area in the data non-recorded state with the
predetermined length, which is found by a search from
the phase change recording layer and is present on an
innermost periphery side, in correspondence with
additional recording control of the target data.

12. A medium according to claim 9, wherein the
25 target data is recorded from one end to the other end
of an area in the data non-recorded state with the

predetermined length, which is found by a search by skipping in increments of predetermined length from a start point on an innermost periphery side of the phase change recording layer and is present on the
5 innermost periphery side, in correspondence with additional recording control of the target data.